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09/229,628 01/13/99 SAKAINO

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EXAMINER

MMC2/1022

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CAD, P  
ART UNIT

PAPER NUMBER

2814  
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/229,628

Applicant(s)

Sakaino et al.

Examiner

Phat X. Cao

Art Unit

2814



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Feb 13, 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-15 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 16-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☒ The proposed drawing correction filed on Feb 13, 2001 is: a) ☐ approved b) ☒ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some\* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 20) ☐ Other:

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### **DETAILED ACTION**

1. Applicant requests to cancel of claims 1 and 2 in the remarks, but not in the amendment.

Therefore, the cancellation of claims 1 and 2 has not been entered.

#### ***Drawings***

2. In the "PROPOSED DRAWING CHANGES" filed 2/13/01, the correction of Fig. 5 by labeled as "prior art" is not entered because Fig. 5 is not "prior art", it is a circuit diagram of Applicant's invention (see page 6, lines 1-2 of the specification).

#### ***Specification***

3. On page 19 of the amendment filed 2/13/01, Applicant indicates that the new abstract is attached to the amendment. However, the new abstract was not attached to the amendment.
4. The specification is objected because the holes punched on the top of the specification cause the missing of some letters in the text. Therefore, submitting the substitute specification is requested.

#### ***Claim Objections***

5. Claims 3, 5, and 20 are objected to because of the following informalities:

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- in claim 3, line 25, "third contact hole group" should be changed to "third contact group".
- in claim 5, line 2, "fist" should be changed to "first".
- in claim 20, line 2, "equal to one or greater than" should be changed to "equal to or greater than".

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

6. Claims 16-21 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

- in claim 16, the limitations of having "the first number is more than twice as large as the second number, and .. the third number is more than twice as large as the fourth number" are not supported by the original disclosure. Specifically, the original disclosure discloses the first number of first contacts being more than the second number of second contacts, but does not disclose "the first number is more than twice as large as the second number" [emphasis added].

- claims 17-21 are also rejected because they depend on independent claim 16.

7. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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- claim 1 recites the limitation "said impurity diffusion region" in lines 7-8 to describe a single impurity diffusion region . There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando (JP. 6-232345 A) in view of Narita (US. 5,844,281).

With respect to claims 1, 3-5, and 16-17, Ando discloses in abstract and Figs. 1(a) and 1(b) a semiconductor integrated circuit device, comprising: impurity diffusion regions 103 formed as source and drain on a semiconductor substrate; a first conductive layer and a third conductive layer 104 having a first resistivity formed on the source/drain impurity diffusions 103; a first contact hole group and a third contact hole group 106 connecting the first conductive layer and the third conductive layer 104 to the source/drain impurity diffusion regions 103, respectively; a second conductive layer and a fourth conductive layer 102 having a second resistivity formed on the first conductive layer and the third conductive layer 104, respectively; a second contact hole group and a fourth contact hole group 105 connecting the first conductive layer and the third

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conductive layer 104 to the second conductive layer and the fourth conductive layer 102, respectively, at an upper part of the source/drain impurity diffusion regions 103, wherein the first conductive layer and the third conductive layer 104 are made of a high-resistance material (see abstract), and wherein the total number of contacts in the first contact hole group 106 is the same as the total number of contact holes in the third contact hole group, and the total number of contact holes in the second contact hole group 105 is the same as the total number of contact holes in the fourth contact group.

Ando does not specifically disclose that a total number of holes in the first contact hole group 106 is more ( or twice) than a total number of holes in the second contact hole group 105 and a total number of holes in the third contact hole group 106 is more ( or twice) than a total number of holes in the fourth contact hole group 105.

However, Narita ('281) teaches in Fig. 2 the obviousness of forming a first conductive layer 11 made of polysilicon (column 5, lines 35-40) and having resistivity higher than resistivity of second conductive layer 3 made of aluminum (column 5, lines 21-22), and the forming of a total number of holes in the first contact hole group 72 being different or more than a total number of holes in the second contact hole group 71.

Given the above teachings, it would have been obvious to one of ordinary skill in the art to modify the device structure of Ando by forming a total number of holes in the first and third contact hole groups being more (or twice) than a total number of holes in the second and fourth contact hole groups for the purpose of preventing the breakdown of diffusion layer by limiting the

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current flowing through the total number of holes in the first and third contact hole groups, such as taught by Narita (column 5, lines 31-35).

With respect to claim 2, Ando discloses the first conductive layer 104 made of a high resistance material (see abstract), but Ando does not disclose the material of the first conductive layer 104 having resistivity higher than the resistivity of the material of the second conductive layer 102. However, as discussed above, Narita ('281) teaches in Fig. 2 the obviousness of forming a first conductive layer 11 made of polysilicon (column 5, lines 35-40) and a second conductive layer 3 made of aluminum (column 5, lines 21-22). And as is well known, polysilicon has a resistivity higher than the resistivity of aluminum. Accordingly, it would have been obvious to one of ordinary skill in the art to form the first conductive layer of Ando having the resistivity higher than the resistivity of the second conductive layer, in view of teaching of Narita, because the higher resistivity of the first conductive layer would also contribute to the benefits of preventing the breakdown of diffusion layer by limiting the current flowing through the high resistivity first conductive layer, such as taught by Narita (column 5, lines 31-35).

With respect to claims 18-21, Ando, in Figs. 1(a) and 1(b), further discloses that the second and fourth contacts 105 are located over end portions of source/drain regions 103 and the first and third contact holes 106 are located over a central portion of the source/drain regions, wherein a distance from an end of the source/drain region 103 to a nearest one of the first contact or third contact 106 is greater than a distance from the gate electrode to the nearest one of the first contact or third contact 106.

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*Allowable Subject Matter*

10. Claims 6-15 are allowed.

The prior art fails to disclose all the limitations recited in the above claims, including the first contact hole group having a plurality of contact holes arranged between neighboring contact holes of the second contact hole group, and the third contact hole group having a plurality of contact holes arranged between neighboring contact holes of the fourth contact hole group.

*Response to Arguments*

11. Applicant's arguments with respect to the claimed invention have been considered but are moot in view of the new ground(s) of rejection.

With respect to amended claims 3-5, because of the new issues, the new ground of rejection is applied.

With respect to new claims 16-21, Applicant argues that neither Ando nor Narita discloses that the number of first contacts is more than twice as large as the number of second contacts as claimed.

However, as indicated by the Examiner in the ground of rejection, the limitations of having “the first number is more than twice as large as the second number, and .. the third number is more than twice as large as the fourth number” are not supported by the original disclosure. Specifically, the original disclosure discloses the first number of first contacts being more than the second number of second contacts, but does not disclose “the first number is more



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than twice as large as the second number” [emphasis added]. Moreover, it is noted that it has been held that changing in ratio/proportion of the essential working parts of a device involves only routine skill in the art. *In re Rose*, 220 F. 2d 459, 105 USPQ 237 (CCPA 1955). In this case, because Narita, in Fig. 2, clearly suggests the forming of a number of first contacts 72 being more than a number of second contacts 71 for preventing the breakdown of diffusion layer by limiting the current flowing through the number of first contacts 72, one skilled in the art would have been motivated to adjust the ratio of the number of first contacts to the number of second contacts depending upon the desired overall resistance and current.

### ***Conclusion***

12. Applicant's amendment of claims 3-5 and new claims 16-21 necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,


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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (703) 308-4917. The Examiner can normally be reached on Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessfully, the Examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. Group 2800 fax number is (703) 308-7722 or (703) 308-7724.

PC  
October 19, 2001

  
Cao, Phat X.  
Patent Examiner  
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